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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,108	09/18/2002	Ronald Scott Bunker	839-1331	8204

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EXAMINER	
KIM, TAE JUN	
ART UNIT	**PAPER NUMBER**
3746	12

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/065,108	BUNKER, RONALD SCOTT
	Examiner	Art Unit
	Ted Kim	3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 January 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-6,11-15,23 and 24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-6, 11-15, 23, 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/14/03 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 4-6, 12-15, 23, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter et al (5,724,816) in view of JP 2001-164901 and Glezer et al (6,098,397) and optionally Shekleton et al (5,024,058). Ritter et al teach a connector segment 40 for connecting a combustor liner and transition piece in a gas turbine, comprising a substantially cylindrical shape body of double-walled construction including inner and outer walls 56, 42, respectively and a plurality of cooling channels 46 extending axially along the segment, between said inner and outer walls 56, 42. Ritter et

al do not teach at least one of said radially inner and outer surfaces is formed with an array of semispherical concavities arranged in staggered rows. Ritter et al do teach the passages are not limited to simple axial passages but more complicated enhanced cooling geometries can be formed such as by machining on surfaces including the inner wall (col. 4, lines 37-40). JP 2001-164901 teach employing concavities (Fig. 5, 6) on turbine component surfaces in the same region as Ritter et al (see page 14, 31) in order to enhance the cooling effectiveness and there is no restriction on what surfaces have the concavities. Glezer et al teach using concavities 84 or 84' arranged in staggered rows on turbine component surfaces in order to enhance the cooling effectiveness. Ranges are disclosed on col. 4, lines 45 and following, these include spacing between adjacent concavities of 1.1-2D as well as the depth ratio of 0.1-0.5D within the claimed range. As for the other ranges, these are believed to be an obvious matter of finding the workable ranges in the art. In fact, JP '901 teaches the concavity diameter d is on the order of 125 to 4000 microns (0.004921 to 0.15748 inches), see e.g. page 27. Ritter et al '816 teach the height of the passages is 0.03 inches (col. 5, line 1) or 0.04 inches high/deep (col. 6, line 52). Using these dimensions would give a height to diameter ratio for the 0.03 inch high passages a range of 0.1905-6.1 and for the 0.04 inch high passages a range of 0.154-8.13. Consequently, applicant's claimed ranges of 0.25-5 and 0.5-1, are clearly within the exemplary ranges known in the prior art and would have been obvious to use without undue experimentation. Hence, it would have been obvious to employ the claimed ranges, as an obvious matter of finding the workable ranges in the art. It would have

been obvious to one of ordinary skill in the art to employ the surface concavities on both the inner and outer walls of Ritter et al, in order to enhance the cooling of these passages, as taught by JP '901 and Glezer et al. As for the issue of using the concavities on both the inner and outer surfaces, this is believed to be obvious, as applied above. However, this teaching is also expressly taught by Shekleton et al, who teaches employing concavities/indentations on either or both of the inner and outer surfaces (col. 5, lines 28-40). Hence, it would have been obvious to one of ordinary skill in the art to apply these concavities to both the inner and outer surfaces, as is well known in the art.

4. Claims 1, 3-6, 11-15, 23, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter et al (5,822,816) in view of JP 2001-164901 and Glezer et al (6,098,397) and optionally Shekleton et al (5,024,058), as applied above and further in view of Ritter et al (5,724,816). Ritter '816 teaches various aspects of the claimed invention but does not teach using a plurality of axially spaced cooling holes in the outer wall. Ritter et al '853 (which incorporates Ritter '816 by reference on col. 1, lines 5-10) teach a connector segment 52 for connecting a combustor liner and transition piece in a gas turbine, comprising a substantially cylindrical shape body of double-walled construction including inner and outer walls 56, 54, respectively and a plurality of cooling channels 60 extending axially along the segment, between said inner and outer walls 56, 54 with a plurality of axial spaced impingement holes 62 in the outer wall. It would have been obvious to one of ordinary skill in the art to employ a plurality of axially spaced cooling holes in the outer wall, as taught by Ritter '853, in order to

facilitate impingement cooling. As for the issue of using the concavities on both the inner and outer surfaces, this is believed to be obvious, as applied above. However, this teaching is also expressly taught by Shekleton et al, who teaches employing concavities/indentations on either or both of the inner and outer surfaces (col. 5, lines 28-40). Hence, it would have been obvious to one of ordinary skill in the art to apply these concavities to both the inner and outer surfaces, as is well known in the art.

5. Claims 1, 3-6, 11-15, 23, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritter et al (5,822,853) in view of JP 2001-164901 and Glezer et al and (6,098,397) and optionally Shekleton et al (5,024,058). Ritter et al '853 teach a connector segment 52 for connecting a combustor liner and transition piece in a gas turbine, comprising a substantially cylindrical shape body of double-walled construction including inner and outer walls 56, 54, respectively and a plurality of cooling channels 60 extending axially along the segment, between said inner and outer walls 56, 54 with a plurality of axial spaced impingement holes 62. Ritter et al do not teach at least one of said radially inner and outer surfaces is formed with an array of semispherical concavities arranged in staggered rows. Ritter et al do teach the passages are not limited to simple axial passages but further enhancements for the convective heat transfer could be employed including roughness elements or other means (col. 7, lines 18-25). JP 2001-164901 teach employing concavities (Fig. 5, 6) on turbine component surfaces in the same region as Ritter et al (see page 14, 31) in order to enhance the cooling effectiveness and there is no restriction on what surfaces have the concavities. Glezer et al teach using

concavities 84 or 84' arranged in staggered rows on turbine component surfaces in order to enhance the cooling effectiveness. Ranges are disclosed on col. 4, lines 45 and following, these include spacing between adjacent concavities of 1.1-2D as well as the depth ratio of 0.1-0.5D within the claimed range. As for the other ranges, these are believed to be an obvious matter of finding the workable ranges in the art. In fact, JP '901 teaches the concavity diameter d is on the order of 125 to 4000 microns (0.004921 to 0.15748 inches), see e.g. page 27. Ritter et al (5,724,816, which is incorporated by reference on col. 1, lines 5-10) teach the height of the passages is 0.03 inches (col. 5, line 1) or 0.04 inches high/deep (col. 6, line 52). Using these dimensions would give a height to diameter ratio for the 0.03 inch high passages a range of 0.1905-6.1 and for the 0.04 inch high passages a range of 0.154-8.13. Consequently, applicant's claimed ranges of 0.25-5 and 0.5-1, are clearly within the exemplary ranges known in the prior art and would have been obvious to use without undue experimentation. Hence, it would have been obvious to employ the claimed ranges, as an obvious matter of finding the workable ranges in the art. It would have been obvious to one of ordinary skill in the art to employ the surface concavities on both the inner and outer walls of Ritter et al, in order to enhance the cooling of these passages, as taught by JP '901 and Glezer et al. As for the issue of using the concavities on both the inner and outer surfaces, this is believed to be obvious, as applied above. However, this teaching is also expressly taught by Shekleton et al, who teaches employing concavities/indentations on either or both of the inner and outer surfaces (col. 5, lines 28-40). Hence, it would have been obvious to one of ordinary

skill in the art to apply these concavities to both the inner and outer surfaces, as is well known in the art.

Response to Arguments

6. Applicant's arguments filed 1/14/03 have been fully considered but they are not persuasive.

As for applicant's arguments regarding the issue of using the concavities on both the inner and outer surfaces, this is believed to be obvious, as applied above. However, this teaching is also expressly taught by Shekleton et al, who teaches employing concavities/indentations on either or both of the inner and outer surfaces (col. 5, lines 28-40). Hence, it would have been obvious to one of ordinary skill in the art to apply these concavities to both the inner and outer surfaces, as is well known in the art.

Contact Information

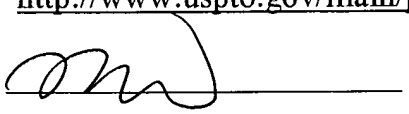
Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 703-308-2631. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 703-872-9306 for Regular faxes and 703-872-9306 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine Yu, can be reached on 703-308-2675.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861.

General inquiries can also be directed to Technology Center Customer Service Office at 703-306-5648 or the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at http://www.uspto.gov/main/patents.htm



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